Name: Date:

Polynomial Factoring solution (version 628)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 24 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 96}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-32}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{8 \pm 4\sqrt{2}\, i}{2}$$

$$x = 4 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $2 + 4i$ and $5 - 3i$ in standard form $(a + bi)$.**

Solution

$$(2 + 4i) \cdot (5 - 3i)$$

$$10 - 6i + 20i - 12i^2$$

$$10 - 6i + 20i + 12$$

$$10 + 12 - 6i + 20i$$

$$22 + 14i$$

Polynomial Factoring solution (version 628)

3. **Write function $f(x) = x^3 - x^2 - 22x + 40$ in factored form. I'll give you a hint: one factor is $(x - 2)$.**

Solution

	1	-1	-22	40
2		2	2	-40
	1	1	-20	0

$$f(x) = (x-2)(x^2 + x - 20)$$

$$f(x) = (x-2)(x-4)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+7)^2 \cdot (x+3) \cdot (x-2)^2 \cdot (x-6)^2$$

Sketch a graph of polynomial $y = p(x)$.